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PTO/SB/21 (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Application Number	09/728,624
Filing Date	11/30/00
First Named Inventor	Michael K. Eneboe
Group Art Unit	2663
Examiner Name	Juntima, N.
Total Number of Pages in This Submission	
Attorney Docket Number	K35A0689

ENCLOSURES *(check all that apply)*

- [✔] Fee Transmittal Form
  - [ ] Fee Attached
- [ ] Amendment / Reply
  - [ ] After Final
  - [ ] Affidavits/declaration(s)
- [ ] Extension of Time Request
- [ ] Express Abandonment Request
- [ ] Information Disclosure Statement
- [ ] Certified Copy of Priority Document(s)
- [ ] Response to Missing Parts/ Incomplete Application
  - [ ] Response to Missing Parts under 37 CFR 1.52 or 1.53
- [ ] Assignment Papers *(for an Application)*
- [ ] Drawing(s)
- [ ] Licensing-related Papers
- [ ] Petition
- [ ] Petition to Convert to a Provisional Application
- [ ] Power of Attorney, Revocation Change of Correspondence Address
- [ ] Terminal Disclaimer
- [ ] Request for Refund
- [ ] CD, Number of CD(s) _____
- [ ] After Allowance Communication to Group
- [ ] Appeal Communication to Board of Appeals and Interferences
- [✔] Appeal Communication to Group *(Appeal Notice, Brief, Reply Brief)*
- [ ] Proprietary Information
- [ ] Status Letter
- [✔] Other Enclosure(s) *(please identify below)*: Postcard

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm or Individual name	Howard H. Sheerin, Registration No. 37,938
Signature	Howard H. Sheerin
Date	5/3/05

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. BOX 1450, ARLINGTON, VA 22313 on: 5/3/05

Typed or printed name	Howard H. Sheerin		
Signature	Howard H. Sheerin	Date	5/3/05

PTO/SB/17 (01-03)
Approved for use through 04/30/2003. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

FEE TRANSMITTAL for FY 2003

Effective 01/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT ($) 500

Complete if Known	
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METHOD OF PAYMENT *(check all that apply)*

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☑ Deposit Account:

Deposit Account Number: 23-1209

Deposit Account Name: WESTERN DIGITAL

The Commissioner is authorized to: *(check all that apply)*

☑ Charge fee(s) indicated below ☑ Credit any overpayments

☑ Charge any additional fee(s) during the pendency of this application

☐ Charge fee(s) indicated below, **except for the filing fee** to the above-identified deposit account.

FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1001	750	2001	375	Utility filing fee	
1002	330	2002	165	Design filing fee	
1003	520	2003	260	Plant filing fee	
1004	750	2004	375	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	

SUBTOTAL (1) ($)

2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

	Extra Claims		Fee from below	Fee Paid
Total Claims		-20** =	x 18.00	=
Independent Claims		- 3** =	x 84.00	=
Multiple Dependent				=

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description
1202	18	2202	9	Claims in excess of 20
1201	84	2201	42	Independent claims in excess of 3
1203	280	2203	140	Multiple dependent claim, if not paid
1204	84	2204	42	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) ($)

**or number previously paid, if greater; For Reissues, see above

FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code	Large Entity Fee ($)	Small Entity Fee Code	Small Entity Fee ($)	Fee Description	Fee Paid
1051	130	2051	65	Surcharge - late filing fee or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	Non-English specification	
1812	2,520	1812	2,520	For filing a request for *ex parte* reexamination	
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action	
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action	
1251	110	2251	55	Extension for reply within first month	
1252	410	2252	205	Extension for reply within second month	
1253	930	2253	465	Extension for reply within third month	
1254	1,450	2254	725	Extension for reply within fourth month	
1255	1,970	2255	985	Extension for reply within fifth month	
1401	320	2401	160	Notice of Appeal	
1402	320	2402	160	Filing a brief in support of an appeal	500
1403	280	2403	140	Request for oral hearing	
1451	1,510	1451	1,510	Petition to institute a public use proceeding	
1452	110	2452	55	Petition to revive - unavoidable	
1453	1,300	2453	650	Petition to revive - unintentional	
1501	1,300	2501	650	Utility issue fee (or reissue)	
1502	470	2502	235	Design issue fee	
1503	630	2503	315	Plant issue fee	
1460	130	1460	130	Petitions to the Commissioner	
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)	
1806	180	1806	180	Submission of Information Disclosure Stmt	
8021	40	8021	40	Recording each patent assignment per property (times number of properties)	
1809	750	2809	375	Filing a submission after final rejection (37 CFR 1.129(a))	
1810	750	2810	375	For each additional invention to be examined (37 CFR 1.129(b))	
1801	750	2801	375	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify) _____

*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) ($) 500

SUBMITTED BY				(Complete *if applicable*)	
Name (Print/Type)	Howard H. Sheerin	*Registration No. (Attorney/Agent)*	37,938	*Telephone* 303-765-1689	
Signature				*Date*	5/3/05

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

In re Application of:
Michael K. Eneboe
Serial No.: 09/728,624
Filed: 11/30/2000
Title: ISOCHRONOUS SWITCHED FABRIC NETWORK

Group Art Unit: 2663
Examiner: Juntima, N.

BRIEF ON APPEAL

THE COMMISSIONER FOR PATENTS
ALEXANDRIA, VA 22313

Sir,

The following appeal brief is submitted pursuant to a Notice of Appeal filed 03/03/05 for the above-identified application.

REAL PARTY IN INTEREST

The real party in interest for the above-identified patent application is Western Digital Technologies, Inc. (see assignment REEL/FRAME: 012651/0433 and 012856/0231 identifying Western Digital Technologies, Inc. as assignee of the entire right, title and interest of the above-identified patent application).

RELATED APPEALS AND INTERFERENCES

There are no known appeals or interferences related to the instant appeal.

STATUS OF CLAIMS

Claims 1-19 are pending.

Claims 1, 11, and 19 stand rejected under 35 USC §102(e).

Claims 2-3, 6-7, 10, 12-13, and 16 stand rejected under 35 USC §103(a).

Claims 4-5, 8-9, 14-15, and 17-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

STATUS OF AMENDMENTS

There are no outstanding amendments.

SUMMARY OF CLAIMED SUBJECT MATTER

FIG. 1 shows an embodiment of the present invention (recited in independent claims 1 and 11) as an isochronous switched fabric network 2 comprising a plurality of interconnected switched nodes 4 forming multiple dimensions (see FIG. 2 and description at page 4 lines 6-25). Each switched node 4A comprises an upstream port and a downstream port (FIG. 2) for each dimension, each upstream and downstream port comprising an input port and an output port (FIG. 8). A discovery facility discovers a depth of each dimension, and discovers resources within each switched node (page 5 lines 19 to page 6 line 9). An addressing facility, responsive to the discovery facility, assigns a matrix address (e.g., FIG. 3A page 6 lines 17-23) to each switched node. A resource reservation facility reserves resources within each switched node to establish a path through the switched fabric network for transmitting an isochronous data stream, and a scheduling facility schedules isochronous data transmitted through the switched fabric network. An example of how the resource reservation system operates is shown in FIG. 6A-6B described at page 10 lines 1-18.

ISSUES

I. Whether claims 1, 11, and 19 are patentable under 35 USC §102(e) over Hahne et al (6,538,416).

II. Whether claims 2-3, 6-7, 10, 12-13, and 16 are patentable under 35 USC §103(a) over Hahne et al (6,538,416)).

GROUPING OF CLAIMS

Claims 1-3, 6-7, 10-13, 16 and 19 stand rejected and are grouped together for the purpose of this appeal.

THE REFERENCES

The following references are relied upon by the examiner:

Hahne et al. 6,538,416 March 25, 2003

THE REJECTIONS

Claims 1, 11, and 19 stand rejected under 35 USC §102(e) as anticipated by Hahne. Regarding independent claims 1 and 11, the examiner asserts Hahne discloses a multi-dimensional network comprising a discovery facility for discovering a depth of each dimension, and an addressing facility for assigning a matrix address to each switched node. For example, the examiner asserts that the source router S1 which generates a PROBE message is used to discover a reservation path, and asserts that an addressing facility is inherently included to assign router identification. Regarding claim 19, the examiner asserts that Hahne inherently discloses the step of leasing idle resources within a first switched node to a second switched node.

Claims 2-3, 6-7, 10, 12-13 stand rejected under 35 USC §103(a) as unpatentable over Hahne. The examiner asserts that the limitations recited in these claims are well known in the art.

ARGUMENT

I. THE ISSUE UNDER 35 U.S.C. §102(e) – HAHNE

A. The rejection should be reversed because Hahnes does not disclose every element recited in the claims, particularly a discovery facility for discovering the depth of each dimension of a multi-dimensional network, and an addressing facility, responsive to the discovery facility, for assigning a matrix address to each switched node.

The rejection of claims 1, 11 and 19 should be reversed because the examiner has incorrectly construed Hahnes as disclosing a multi-dimensional network comprising a discovery facility for discovering a depth of each dimension, and an addressing facility for assigning a matrix address to each switched node.

The examiner assets that Hahne discloses a discovery facility as a PROBE message used to discover a reservation path between two routers, such as router S1 and S3 (col. 4, lines 40-45, 59-67 and col. 6 line 32 – col. 7 line 1-2). However, the PROBE message does not discover the depth of each dimension of the network, it merely discovers whether the nodes through a particular path have sufficient resources to accommodate the bandwidth of a requested reservation (col. 4, lines 59-66). If the network cannot accommodate the reservation, a rejection message is returned to the source router and the PROBE message is not forwarded any further downstream (col. 5, lines 1-3). Therefore, the PROBE message is not used to discover the depth of each dimension, it is used to discover a reservation path through the network. In addition, because the PROBE message is "not forwarded any further downstream" when an insufficient router is encountered, the PROBE message is not transmitted throughout the entire dimension and therefore cannot discover the depth of each dimension as recited in the claims.

The examiner further asserts that Hahne discloses an addressing facility as a GRAFT message 16 generated by router S3 and returned to router S1 in response to the PROBE message, wherein the GRAFT message contains router identification of each node between S1 to S3 in the reserved path (col. 7, lines 1-7 and 27-36). However, the GRAFT message merely performs the reservation process by reserving the resources at each node through the reserved path (col. 5, lines 5-17; col. 4, lines 45-47: "The GRAFT messages (i.e., response messages) establish and set-up the actual reservation.") Although the GRAFT message contains router identification for each node, the identification applies only to the nodes through the reservation path to facilitate the reservation request. The GRAFT message does not assign a matrix address to each node through each dimension in response to the discovery facility as recited in the claims. The rejection should be reversed.

Regarding claim 19, the examiner asserts that Hahne inherently discloses the step of leasing idle resources within a first switched node to a second switched node. The examiner asserts that the routers disclosed by Hahne must inherently "lease" resources from one another in order to enable reservation of sufficient bandwidth. However, this interpretation of Hahne is incorrect. Referring to col. 4, lines 63-65, "as the PROBE message passes through the routers, each router determines if it is capable of accommodating the amount (i.e., size) of the bandwidth requested in the reservation." If any one of the routers is incapable of accommodating the bandwidth request, a rejection message is returned to the source router (col. 5, lines 1-3). Nowhere does Hahne disclose or suggest that if a particular router cannot accommodate a bandwidth request to lease resources from another router in order to accommodate the request. The rejection should be reversed.

II. THE ISSUE UNDER 35 U.S.C. §103(a) – HAHNE

A. The rejection should be reversed because the limitations recited in the dependent claims are not well known when combined with the elements recited in the independent claims .

The rejections of claims 2-3, 6-7, 10, 12-13 should be reversed for the reasons set forth above since the limitations recited in the dependent claims, in combination with the limitations recited in the independent claims, are not made obvious by Hahne or the general knowledge of those skilled in the art.

CONCLUSION

Reversal of the rejections in this appeal is respectfully requested.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 23-1209, and please credit any excess fees to such deposit account.

Respectfully submitted,

Date: 5/3/05 By: _____

Howard H. Sheerin
Reg. No. 37,938
Tel. No. (303) 765-1689

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on:

5/3/05 Howard H. Sheerin
(Date) (Print Name)

_____
(Signature)

APPENDIX

A complete listing of the claims on appeal:

1. An isochronous switched fabric network comprising:

(a) a plurality of interconnected switched nodes forming multiple dimensions, each switched node comprising an upstream port and a downstream port for each dimension, each upstream and downstream port comprising an input port and an output port;

(b) a discovery facility for discovering a depth of each dimension, and for discovering resources within each switched node;

(c) an addressing facility, responsive to the discovery facility, for assigning a matrix address to each switched node;

(d) a resource reservation facility for reserving resources within each switched node to establish a path through the switched fabric network for transmitting an isochronous data stream; and

(e) a scheduling facility for scheduling isochronous data transmitted through the switched fabric network.

2. The isochronous switched fabric network as recited in claim 1, wherein the discovery facility comprises a central processor.

3. The isochronous switched fabric network as recited in claim 2, wherein the central processor is attached to one of the switched nodes.

4. The switched fabric network as recited in claim 3, wherein:

(a) the switched nodes are connected in each dimension to form a loop;

(b) the central processor transmits an initialization packet through the output port of each downstream port to the input port of the corresponding upstream ports of adjacent switched nodes, thereby transmitting an initialization packet through each dimension;

(c) each switched node along each dimension modifies the initialization packet and forwards the initialization packet through the corresponding downstream port for the dimension; and

(d) the central processor evaluates each initialization packet transmitted through each dimension to determine the depth of each dimension and to determine the resources within each switched node.

5. The switched fabric network as recited in claim 4, wherein:

(a) the initialization packet comprises a dimension node number (DNN) comprising a plurality of sub-fields;

(b) each sub-field represents one of the dimensions; and

(c) each switched node along each dimension increments the corresponding sub-field within the DNN in the initialization packet.

6. The isochronous switched fabric network as recited in claim 1, wherein the discovery facility is distributed throughout the switched nodes.

7. The isochronous switched fabric network as recited in claim 6, wherein the discovery facility comprises a plurality of processors attached to the switched nodes.

8. The isochronous switched fabric network as recited in claim 6, wherein:

(a) the switched nodes are connected in each dimension to form a loop;

(b) an initialization packet comprising an initialization identification (ID) and an initialization dimension node number (DNN) is transmitted between the switched nodes of each dimension; and

(c) each switched node further comprises:

a local ID;

a local DNN representing at least part of the matrix address for the switched node; and

a controller for comparing the initialization ID to the local ID and for modifying the local DNN and the initialization DNN in response to the comparison.

9. The switched fabric network as recited in claim 1, wherein the matrix address comprises a plurality of contiguous sub-fields corresponding to each dimension, each sub-field comprising a number of bits n where:

$$n = \text{round}(0.5 + (\log(\text{dimension\_depth})/\log(2)))$$

where the dimension_depth is the depth of the dimension corresponding to the sub-field.

10. The switched fabric network as recited in claim 1, wherein:

(a) the resource reservation facility is distributed throughout the switched nodes; and

(b) each switched node comprises a leasing facility for leasing idle resources to other switched nodes.

11. A method of transmitting data through an isochronous switched fabric network comprising a plurality of interconnected switched nodes forming multiple dimensions, each switched node comprising an upstream port and a downstream port for each dimension, each upstream and downstream port comprising an input port and an output port, the method comprising the steps of:

(a) discovering a depth of each dimension and discovering resources within each switched node;

(b) assigning a matrix address to each switched node in response to the step of discovering a depth of each dimension;

(c) reserving resources within each switched node to establish a path through the switched fabric network for transmitting an isochronous data stream; and

(d) scheduling isochronous data transmitted through the switched fabric network.

12. The method of transmitting data through an isochronous switched fabric network as recited in claim 11, wherein a central processor performs the discovery steps.

13. The method of transmitting data through an isochronous switched fabric network as recited in claim 12, wherein the central processor is attached to one of the switched nodes.

14. The method of transmitting data through an isochronous switched fabric network as recited in claim 13, wherein the switched nodes are connected in each dimension to form a loop, the method further comprises the steps of:

(a) the central microprocessor transmitting an initialization packet through the output port of each downstream port to the input port of the corresponding upstream ports of adjacent switched nodes, thereby transmitting an initialization packet through each dimension;

(b) modifying the initialization packet at each switched node and forwarding the initialization packet through the corresponding downstream port for the dimension; and

(c) the central microprocessor evaluating each initialization packet transmitted through each dimension to determine the depth of each dimension and to determine the resources within each switched node.

15. The method of transmitting data through an isochronous switched fabric network as recited in claim 14, wherein:

(a) the initialization packet comprises a dimension node number (DNN) comprising a plurality of sub-fields;

(b) each sub-field represents one of the dimensions; and

(c) each switched node along each dimension increments the corresponding sub-field within the DNN in the initialization packet.

16. The method of transmitting data through an isochronous switched fabric network as recited in claim 11, wherein the discovery step is distributed to the switched nodes.

17. The method of transmitting data through an isochronous switched fabric network as recited in claim 16, wherein the switched nodes are connected in each dimension to form a loop, each switched node comprises a local identification (ID) and a local dimension node number (DNN) representing at least part of the matrix address for the switched node, the method further comprises the steps of:

(a) transmitting an initialization packet comprising an initialization ID and an initialization dimension node number (DNN) between the switched nodes of each dimension; and

(b) comparing the initialization ID to the local ID within each switched node and modifying the local DNN within each switched node and the initialization DNN in response to the comparison.

18. The method of transmitting data through an isochronous switched fabric network as recited in claim 11, wherein the matrix address comprises a plurality of contiguous sub-fields corresponding to each dimension, each sub-field comprising a number of bits n where:

$$n = \text{round}(0.5 + (\log(\text{dimension\_depth})/\log(2)))$$

where the dimension_depth is the depth of the dimension corresponding to the sub-field.

19. The method of transmitting data through an isochronous switched fabric network as recited in claim 11, further comprising the step of leasing idle resources within a first switched node to a second switched node.